**Abstract ID** : 712

**Title** : Female social structure within the grey seal (Halichoerus grypus) breeding colony on North Rona, Scotland

**Category** : Behavior

**Student** : Doctoral

**Preferred Format** : Oral Presentation

**Abstract** : Social structure has potential consequences for individual fitness. However, traditional indices used to describe social structure have limitations when applied to pinniped breeding colonies. Here, new indices to quantify social structure are developed and applied to female grey seals (Halichoerus grypus) breeding on North Rona, Scotland. During the 2002 breeding season a series of 22 photo-identification surveys were carried out and linked to high resolution mapping to record the spatio-temporal organisation of individuals within the colony. Fine-scale observations of seal movements suggested that females were unlikely to encounter others over distances greater than 10m and so this was used as the spatial scale over which to investigate social structure. Two indices are described, those of Social Stability (SS): the invariance of individuals within an area through time, and Social Cohesion (SC): the maintenance of an individual's neighbours through time. Both indices take possible values between 0 and 1. Measures of Social Stability within the colony varied widely suggesting some areas had a more consistently stable social environment than others (SS: median=0.26, range=0.72, n=49). Areas of high Social Stability also contained animals with the highest levels of Social Cohesion (SC: median=0.46, range=0.58, n=6). Social Cohesion increased as individual movement decreased ($r_s$=-0.886, n=6, $p<0.05$) and animals that pupped earlier in the season were associated with higher SC values ($r_s$=-0.829, n=6, $p<0.05$). Maternal efficiency, measured by the proportion of maternal expenditure realised as pup mass gain, tended to be higher for mothers with high Social Cohesion values ($r_s$=0.714, n=6, p=0.111). These results provide evidence of social complexity within a grey seal breeding colony and the first indication of the fitness benefits of a stable social environment.